

## CHAPTER 3

# PREVENTIVE DENTISTRY

### INTRODUCTION

The goal of preventive dentistry is to assist the patient in either establishing control of his or her dental disease or in continuing to maintain good oral health. Preventive dentistry includes all clinical tests, treatments, and patient education for the purpose of preventing oral disease and supporting the effectiveness of treatment aimed at caries and periodontitis. All patients will receive a careful assessment of their oral health needs and be provided with an individualized preventive dentistry treatment plan.

### PREVENTIVE DENTISTRY TECHNICIAN

Each dental treatment facility has an appointed preventive dentistry officer responsible for the formulation, supervision, and execution of all aspects of the preventive dentistry program as per SECNAVINST 6600.5. For you to perform preventive dentistry procedures, you should elect to qualify as an expanded function preventive dentistry technician at your command. Details for this program can be found in BUMEDINST 6600.13. Some of the duties of a preventive dentistry technician are as follows:

- Completes a thorough dental health questionnaire review
- Performs supragingival scalings with hand and sonic instruments
- Performs oral prophylaxis
- Provides nutrition/diet counseling
- Applies topical anticariogenic agents
- Places pit and fissure sealants
- Delivers pre-operative oral antimicrobial rinses
- Sharpens and demonstrates proper care of periodontal instruments
- Demonstrates proper patient instruction in the use of home care devices

### ORAL PROPHYLAXIS

The term *prophylaxis* means prevention of disease. When you apply its broadest interpretation to the oral cavity, it includes all measures to prevent oral disease. For our purposes, we define oral prophylaxis as *the clinical procedures that you perform for your patients*. Our discussion will include evaluation of records, the seating of the patient, instruments, examinations, and contraindications to prophylaxis. We will begin with the evaluation of the patient's dental health record.

### PREPARATION FOR ORAL PROPHYLAXIS

Before the patient enters the dental treatment room (DTR), evaluate his or her dental record for completeness. The folder should contain the patient's dental records, current radiographs, a current dental health questionnaire and any other applicable forms discussed in *Dental Technician*, Volume 1, NAVEDTRA 12572, chapter 2, and chapter 2 of this manual. Check the past medical and dental history of the patient. Check the recommendations that were made during previous oral prophylaxis appointments and the recent dental examinations. If the patient has had radiographs taken since the previous oral prophylaxis, evaluate them for subgingival calculus and restoration margin overhangs. Subgingival calculus can appear on a radiograph as a "spur" or deposit between the teeth, below the gingival margin.

**NOTE:** Subgingival calculus and overhangs can only be removed by a dental officer or dental hygienist.

If you find any subgingival calculus during the patient examination or treatment, contact a dental officer or hygienist who will remove it either during your appointment with the patient or at a later time. A preventive dentistry technician should only treat patients with supragingival calculus who are scheduled for routine oral prophylaxis. Patients with subgingival calculus will be appointed with a dental officer or dental hygienist. The dental treatment plan will indicate who will treat the patient to ensure proper scheduling.

## CONTRAINDICATIONS TO PROPHYLAXIS

Evaluate the medical history of dental patients before treatment begins. NAVMED Form 6600/3 will be completed to find out whether there are any medical problems that can affect dental treatment. Some patients have medical conditions, such as a heart murmur, that require antibiotic treatment 1 hour before you can treat them. If the medical history indicates the patient has or had a heart murmur, ask the patient if he or she has taken any antibiotic medicine.

**NOTE:** If any questions on the NAVMED 6600/3 are answered "yes," it is of the utmost importance that you discuss the patient's history with a dental officer before rendering treatment.

## PATIENT AND OPERATOR POSITIONING

Correct operator and patient positioning helps to accomplish the following:

- Prevents operator and patient fatigue and discomfort
- Permits the operator to gain a clear view of the tooth being worked on
- Allows easy access of instruments to the teeth
- Saves time

### Patient Positioning

Position the back of the patient's chair at about a 15° angle (slightly raised above the parallel position) to the floor (fig. 3-1).

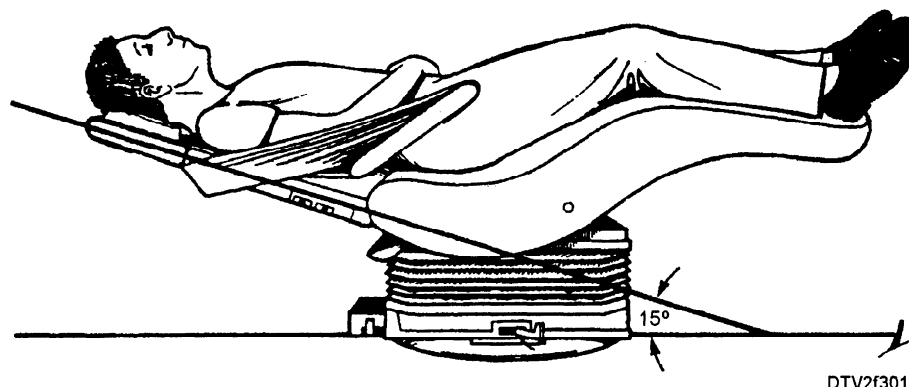


Figure 3-1.—Positioning of the patient.

The patient's heels should be even or slightly higher than the head. The top of the patient's head must be even with the end of the headrest for you to see and reach the patient's mouth. If possible, position the bracket tray out of the patient's direct vision. Ask the patient if he or she is in a comfortable position.

### Operator Positioning

To properly position yourself in the seated operator position, adjust the chair so that you are comfortable and your posture is correct. To maintain good working posture (fig. 3-2), position your feet flat on the floor, thighs parallel to the floor, back and head straight, and arms at waist level. Keep your body weight evenly distributed.

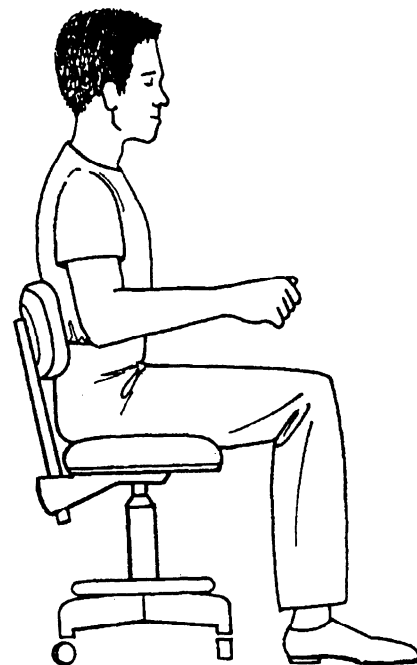


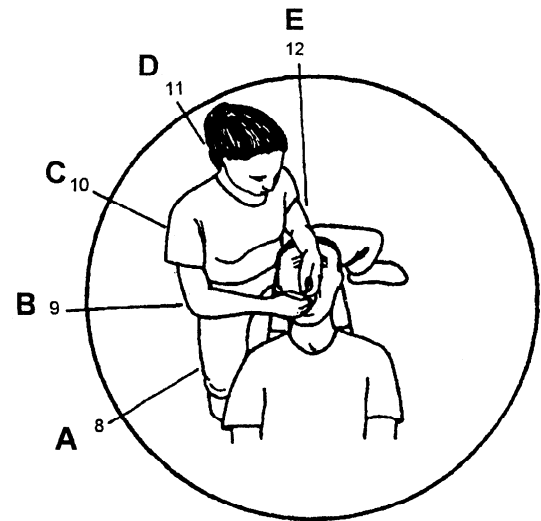
Figure 3-2.—Seated operator position.

Your unit light is kept at arms length above or in front of the patient. The light should be easy to reach but not near the patient's or operator's head. Illumination of the treatment area becomes more difficult when the light is positioned too close to the patient. In addition the light generates a large amount of heat. Direct the unit light from above the patient as shown in figure 3-3.

The position of the bracket table should be low enough to permit a clear view of the instruments. It should also be a reasonable distance above and to the side of the patient.

The patient's open mouth should be level with your waist. This will enable you to reach the patient's mouth while maintaining your arms at waist level. For mandibular instrumentation, the patient will have his or her mouth open in a chin-down position. Position your legs under the back of the chair. The back of the dental chair should touch the top of your legs, or you may straddle the back of the chair with your legs.

Now you are ready to learn how to position yourself around your patient in relation to the treatment areas of the mouth. Operating positions for right-handed and left-handed technicians are usually identified in relation to a 12-hour clock (figs. 3-4 and 3-5).

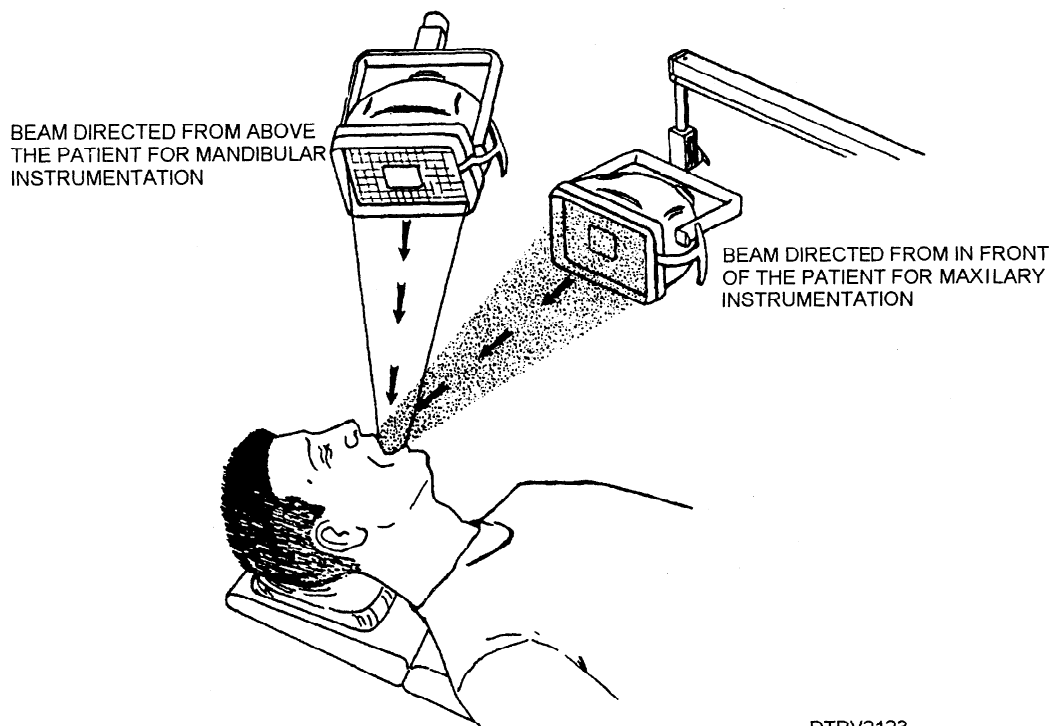


- A. 8 O'CLOCK POSITION, OPERATOR SEATED TO THE FRONT OF THE PATIENT
- B. 9 O'CLOCK POSITION, OPERATOR SEATED AT THE SIDE OF THE PATIENT
- C. 10 O'CLOCK
- D. 11 O'CLOCK POSITION (ILLUSTRATED ABOVE)
- E. 12 O'CLOCK POSITION, OPERATOR SEATED TO THE REAR OF THE PATIENT

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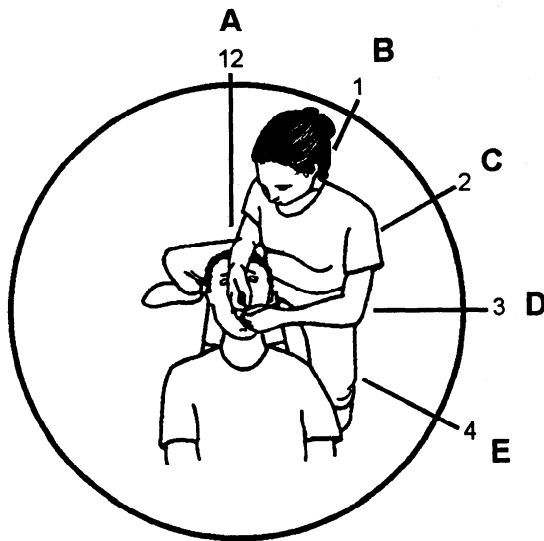
**Figure 3-4.—Operating positions—right-handed operator.**

As you try various positions, notice how they afford you a clear view of the treatment area. You will not be able to obtain a clear view of the teeth surfaces in the mouth through operator and patient positioning



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**Figure 3-3.—Unit light placement.**



- A. 12 O'CLOCK POSITION, OPERATOR SEATED TO THE REAR OF THE PATIENT  
 B. 1 O'CLOCK POSITION, (ILLUSTRATED ABOVE)  
 C. 2 O'CLOCK POSITION  
 D. 3 O'CLOCK POSITION, OPERATOR SEATED AT THE SIDE OF THE PATIENT  
 E. 4 O'CLOCK POSITION, OPERATOR SEATED TO THE FRONT OF THE PATIENT

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Figure 3-5.—Operating positions-left-handed operator.

alone. The use of the mouth mirror will assist you to obtain a complete view.

## SCREENING EXAMINATION

Before you begin any scaling procedures, make a thorough appraisal of the condition of the patient's mouth. This examination serves three purposes:

- Determines the needs of the patient
- Determines the sequence in which these needs must be met
- Provides you with useful information for conducting the dental health counseling

The screening examination has two phases:

- Observation of the entire oral mucosa
- Examination of the teeth and gingival tissues

Look for ulcers or sores on the lips, skin, or intraoral mucosa. These may be the result of viral or other infections, which could preclude your treatment of the patient. You can also ask the patient if he or she has any sensitive or painful teeth or areas in the mouth about which you should know. If you see something during your examination that you do not recognize as a normal feature of the anatomy, check with a dental officer before proceeding.

Plaque is nearly transparent and difficult to see without the use of a stain or disclosing agent to highlight its presence. These agents color the plaque, but they do not color clean tooth surfaces. The coloring agent used in disclosing is a harmless red food dye and comes in the form of tablets or liquid. Follow the manufacturer's instructions for use. After your initial examination of the patient, apply a disclosing agent to reveal the presence of plaque before the prophylaxis procedures. This will help you and the patient identify what must be cleaned and will assist in patient education.

## TYPES, USES, AND MAINTENANCE OF PERIODONTAL EQUIPMENT

The ultrasonic scaler, air polishing unit, and sonic scaler were designed for use in oral prophylaxis and other periodontal procedures.

### WARNING

Before operating any equipment, ensure you are familiar with its use, operation, and safety precautions.

## ULTRASONIC SCALER

The ultrasonic scaler converts electrical energy into 30,000 microscopically small mechanical strokes per second. The strokes are transmitted to an insert tip. Combined with a water spray and a light touch, the activated tip rapidly and gently dislodges plaque, calculus, and stain from the teeth. As you can imagine, the ultrasonic unit can generate a great amount of heat. For this reason, water is kept running through the entire unit and expelled from the working end of the instrument. Water aids to cool the tip of the instrument and the tooth structure. The water also serves to wash away debris. The vibratory motion of the tip transmits mechanical energy to water that creates powerful bursts of collapsing bubbles called cavitation. Cavitation aids in the mechanical removal of plaque and calculus by the vibrating tip.

### Components

The four major components of the unit are an electronic generator, a hand piece assembly, a set of interchangeable inserts, and a foot-controlled switch. A picture of an ultrasonic scaler unit is shown in

figure 3-6. Follow the manufacturer's instructions on setup, adjusting water flow, ultrasonic tuning, and ultrasonic power. Some units are tuned automatically while others require manual tuning.

**ELECTRONIC GENERATOR.**—The electronic generator produces the power required to activate the handpiece. The three controls located on the front panel of an automatically tuned ultrasonic unit are the ON/OFF indicator, POWER ADJUSTMENT CONTROL, and a WATER ADJUSTMENT CONTROL. A manually tuned ultrasonic unit will also have a TUNING ADJUSTMENT CONTROL.

**HANDPIECE AND CABLE ASSEMBLY.**—This assembly consists of a handpiece into which interchangeable scaling inserts are placed. A cable connects the handpiece to the generator. To place an

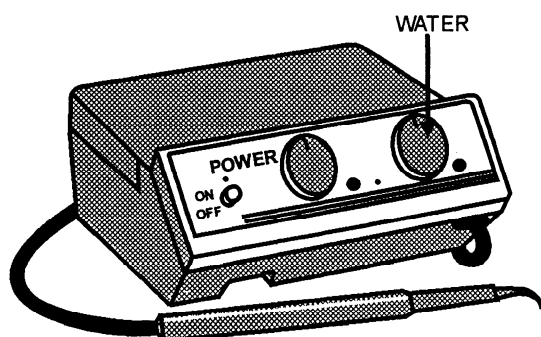
insert into the handpiece, first lubricate the O-ring with water. Then hold the handpiece with the open end upright over a sink or suitable basin. Step on the foot switch to turn on the unit and flood the handpiece chamber with water. Stop flooding when you see the water has reached a level halfway up the handpiece. Push the insert into the open end of the handpiece with a twisting motion (fig. 3-7); a small amount of water may be displaced by the insert stack and may spill out. Check to see if the insert is fully seated. With the insert in place, hold the handpiece in an upright position. Activate the insert and bleed off any air trapped during handpiece insertion. Allow the water to run from the handpiece for a few seconds until it flows without spurting. Repeat this procedure each time an insert is placed into the handpiece. Trapped air does not interfere with the handpiece operation, but can cause excessive heating of the instrument.

**INTERCHANGEABLE INSERTS.**—A set of interchangeable inserts facilitates access to all areas of the mouth. The components of an insert include the insert tip, water outlet, plastic grip, O-ring, connecting body, and the magnetostrictive stack (fig. 3-8). The water outlet delivers preheated water along the entire working length of the tip. The O-ring acts as a water seal when the insert is placed into the open end of the handpiece. A connecting body transmits motion from the stack to insert tip. The magnetostrictive stack converts electrical power supplied to the handpiece into mechanical vibrations to activate the insert tip.

**FOOT CONTROLLED SWITCH.**—The handpiece is activated by a foot-operated on/off switch. When the foot pedal is held down, the handpiece is activated and water flows. Both the handpiece and water flow are shut off when the pedal is released.

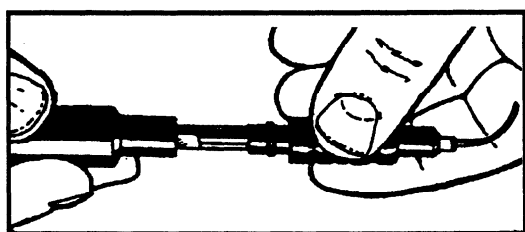
### Water Supply

Attached to the ultrasonic scaling unit is a water supply hose. The free end of the hose attaches to a



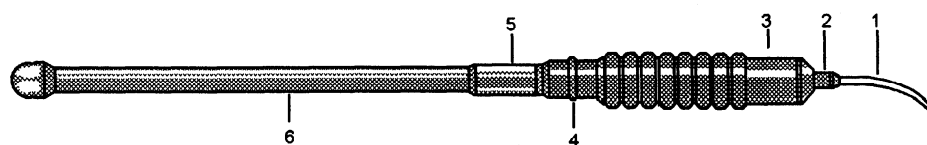
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Figure 3-6.—Ultrasonic scaler unit.



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Figure 3-7.—Placement of the insert into the handpiece.



- |                 |                           |
|-----------------|---------------------------|
| 1) INSERT TIP   | 4) O-RING                 |
| 2) WATER OUTLET | 5) CONNECTING BODY        |
| 3) PLASTIC GRIP | 6) MAGNETOSTRICTIVE STACK |

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Figure 3-8.—Components of the interchangeable inserts.

water connection on the dental unit. The water supply pressure should range from a minimum of 25 psi to a maximum of 60 psi. Water pressure outside of this range can cause the equipment to malfunction. Refer to the manufacturer's instructions for specific information.

Flush the waterline daily before use to reduce the bacteria that accumulates overnight. Set the water flow to maximum and depress the foot switch for 1 minute without an insert in the handpiece. Before use on each patient, flush the waterline for 30 seconds.

### Ultrasonic Tips and Techniques

A wide variety of inserts are available for use with the ultrasonic scaler. Each insert is designed for a specific use. A power level is recommended by the manufacturer for each insert.

Tip selection is based on the type, location, and amount of calculus deposits present. Larger tips are effective in removing heavy supragingival calculus deposits and stains, where smaller tips used by a dentist or hygienist are similar in design to a scaler and can be used subgingivally. The tips should be dull so they will not damage the tooth and root surface. The various tips and their uses are as follows:

- Beaver-tail ultrasonic tip (fig. 3-9)—Used on the lingual and facial posterior surfaces to remove very heavy, supragingival deposits. Use light pressure with an erasing motion for stain removal and overlapping strokes for calculus removal. Avoid using the sides or face of this insert. Use the high power level with this insert.

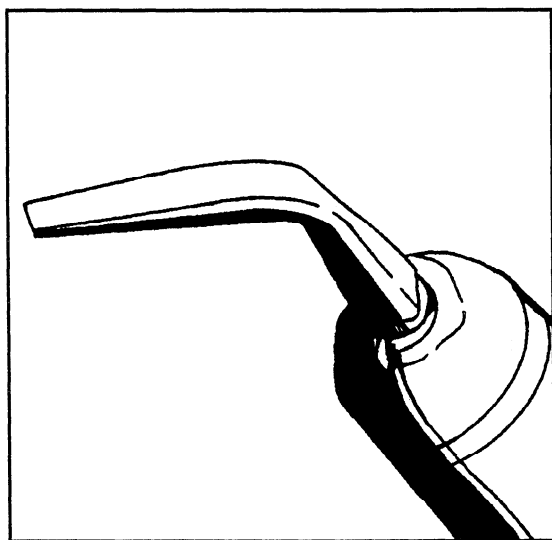


Figure 3-9.—Beaver-tail ultrasonic tip.

- Chisel ultrasonic tip (fig. 3-10)—Used for removing supragingival calculus on anterior teeth. Place the tip against the proximal tooth surface and use a horizontal stroke to remove the calculus. **Set the power level on high for this insert.**

- Universal ultrasonic tip (fig. 3-11)—The most commonly used tip for supra and subgingival calculus deposits in all areas. The universal tip is ideally suited for finishing after completing heavier scaling procedures. Use the sides of the insert with only light pressure, and push or pull strokes. **Set the power level at high for this insert.**

- Periodontal probe ultrasonic tip (fig. 3-12)—Used to remove subgingival calculus. Used by dentist or dental hygienist with a horizontal or vertical stroke. **Set the power level on medium for this insert.**

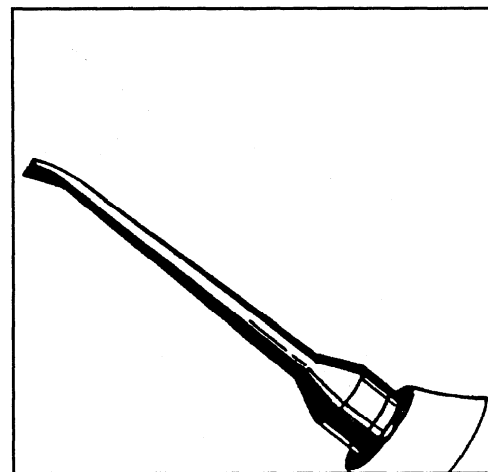


Figure 3-10.—Chisel ultrasonic tip.

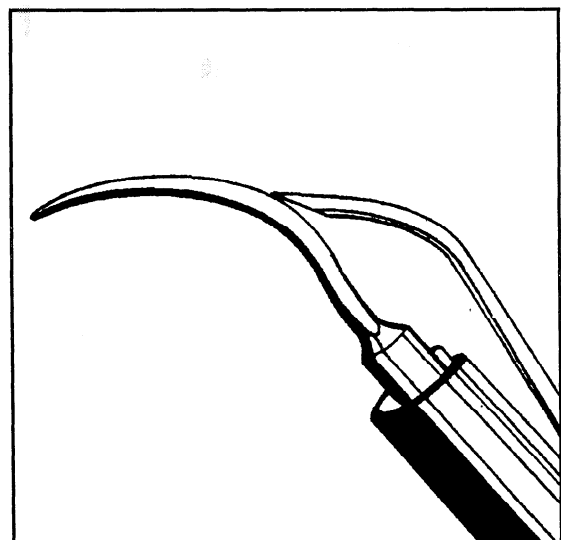


Figure 3-11.—Universal ultrasonic tip.

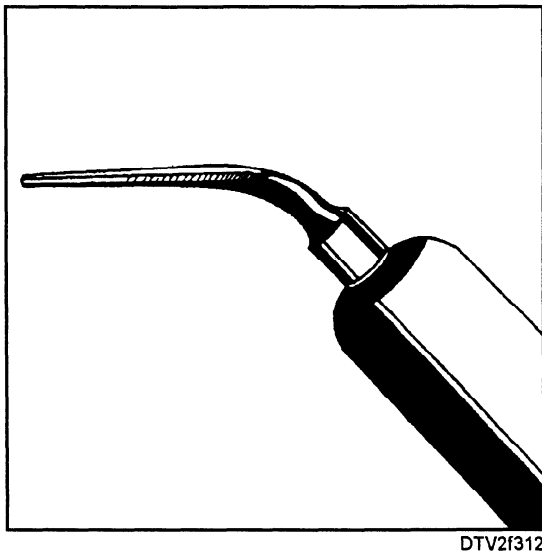


Figure 3-12.—Periodontal probe ultrasonic tip.

Before starting ultrasonic scaling, take time to explain the procedure to your patient. The noise, water spray, and vibratory sensation produced by the ultrasonic scaler may frighten the patient if no warning is given. Place a plastic drape on your patient in addition to the patient towel to prevent clothing from becoming wet. If possible, have the patient rinse for 30 seconds with an antimicrobial mouthwash before treatment to reduce aerosol pathogens. The amount of water that will accumulate in the patient's mouth will necessitate the use of a saliva ejector. Ask your patient to hold the evacuation tip if necessary.

Hold the ultrasonic handpiece in a modified pen grasp (discussed later in this chapter) with the end of the hose tucked in the palm of your hand. This prevents the hose from weighing down the handpiece. Establish a fulcrum (discussed later) on a tooth in the same arch as close as possible to the tooth you are treating. The working end of the instrument tip should be adapted to a 10° to 15° angle to the long axis of the tooth. Use the lateral surfaces, face, and back of the instrument tip for scaling. The toe or tip of the working end should **never be used to scale**.

### Patient Sensitivity

If the patient reports tooth sensitivity during ultrasonic scaling, several possibilities exist. First, be certain the insert tip is at a 10° to 15° angle to the tooth surface. You can increase the speed of tip movement over hypersensitive areas to alleviate discomfort. A change in the motion of the insert tip from vertical to horizontal, or vice versa, sometimes helps diminish

sensitivity. It may be necessary to lighten your finger pressure on the handpiece, especially on exposed dentin. If sensitivity persists, decrease the power setting.

**NOTE:** Incorrect adaptation of the instrument to the tooth will cause pain to the patient and damage to the tooth.

It is very important to understand that the instrument tip must be in direct contact with the calculus deposit to be effective. Use light, rapid strokes, keeping the tip moving at all times to avoid heat build up or tooth damage.

### Level I Maintenance

No special maintenance is required; however, several precautionary measures should be followed:

- Do **not** place the unit on or next to a heat source since it could damage the electronic components.
- Do **not** keep the unit in a tightly confined space or corner. Keep it where a normal amount of air will circulate freely on all sides of the unit.
- The unit should **not** be used when the patient or operator of the unit is wearing a cardiac pacemaker.

You may experience some difficulties with the unit that requires minor adjustments. For example, the handpiece may heat up if there is insufficient water flow or air is trapped in the handpiece. Water flow requires adjustment if the spray from the insert does not properly cover the area of the activated insert tip. Water leaks from the handpiece during operation generally indicate that the O-ring on the insert is worn and requires replacement. Always consult the manufacturer's instructions for the causes and corrective measures for other problems.

### AIR POLISHING UNIT

The air polishing unit (fig. 3-13) uses air and water to project a controlled stream of specially processed sodium bicarbonate. It removes gross extrinsic stain, plaque, and soft debris from all exposed surfaces of the tooth enamel. It polishes and cleans tooth surfaces, pits, and fissures. Some patients prefer this method of polishing, which reduces the sense of pressure and heat associated with use of a rubber cup and pumice. Air polishing is ideal for polishing teeth to which

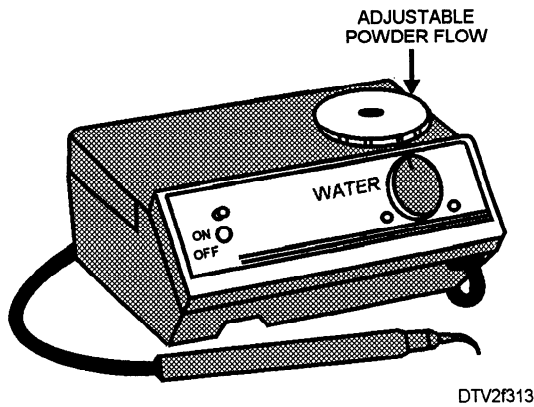


Figure 3-13.—Air polishing unit.

orthodontic bands and brackets are applied. Air polishing of enamel also increases resin bond strength when used before acid etching for sealants and other procedures.

### Components

The three major components of the unit are the air polishing delivery system, foot-controlled switch, and handpiece assembly. Some newer models combine the air polishing and ultrasonic systems. In such units, additional components and controls exist because the units are combined (fig. 3-14). The combination handpiece assembly has separate openings to accommodate the scaling and polishing inserts (fig. 3-15). The operation and maintenance of the combined unit are the same as the two independent units.

### Technique

Keep the handpiece tip approximately 4mm to 5mm from the tooth surface being cleaned. Center the spray on the middle one-third of the tooth and use a constant circular motion. The edge of the spray will

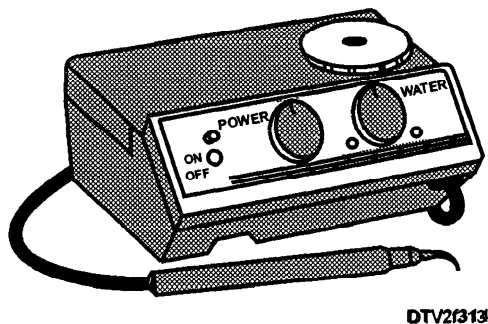


Figure 3-14.—Combined ultrasonic scaler and air polishing unit.

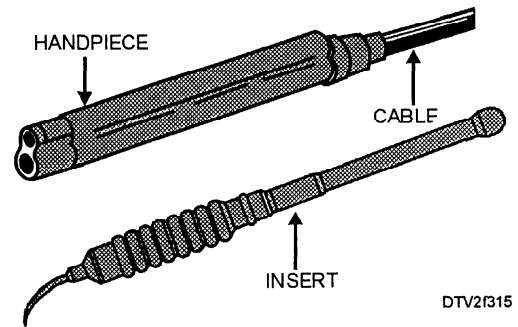


Figure 3-15.—Handpiece assembly of an air polishing unit.

clean the tooth surface near the gingiva. The angulation of the handpiece tip to the surface varies according to the different locations of the teeth.

On the facial and lingual surfaces of all posterior teeth, direct the handpiece slightly distally at an 80° angle toward the gingiva (fig. 3-16). On the facial and lingual surfaces of all anterior teeth, direct the handpiece at a 60° angle toward the gingiva (fig. 3-16). For all occlusal surfaces, direct the handpiece at a 90° angle to the surface.

### Precautions and Contraindications

You must be concerned with several precautions and contraindications to the use of the air polishing system. Avoid direct contact of the cleaning jet with soft tissue. This could seriously and unnecessarily harm mucosa or gingiva. To preclude possible soft tissue emphysema or air embolism effects, never direct the tip into the sulcus. Sodium bicarbonate air polishing of highly polished metal restorations will leave a matte (dull) finish. Avoid prolonged use of this system on cementum or dentin. Consult with a dentist

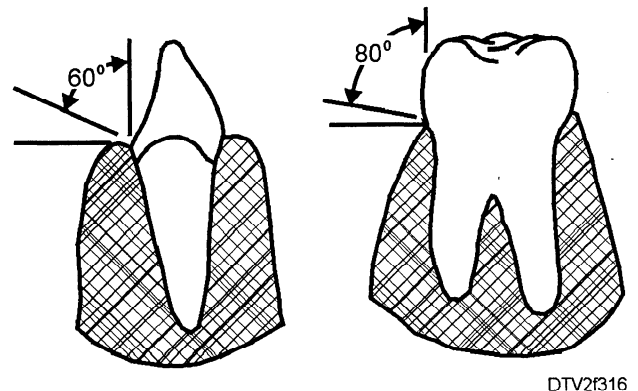


Figure 3-16.—Angulation of the air polishing handpiece tip on facial and lingual surfaces of anterior and posterior teeth.



before air polishing teeth in patients with severe respiratory illness or on a restricted sodium diet. Patients wearing contact lenses must remove them before you use this polishing system.

### Level I Maintenance

The waterline should be flushed daily before use for 60 seconds to reduce any bacteria that accumulates in the line overnight. The handpiece should be flushed for 30 seconds before use between patients. At the end of the day, remove and empty the powder chamber. The cleaning powder must be kept dry and stored in a place that does not exceed 95°F. For additional information on maintenance of the powder chamber and other procedures, refer to the manufacturer's instructions.

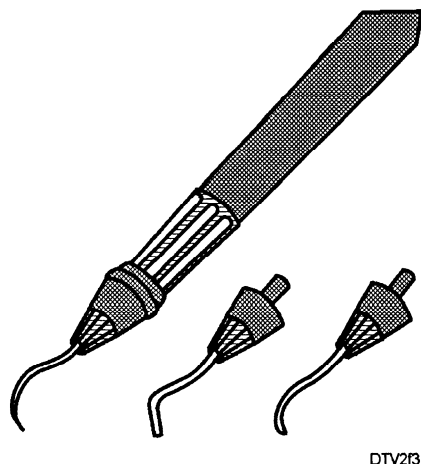
## SONIC SCALER

The sonic scaler is an air-powered, mechanical scaler that runs at sonic frequency and uses a controlled water spray. It removes large calculus deposits and stains from teeth.

### Components

The sonic scaler consists of the scaler handpiece and three types of tips (fig. 3-17). Both the tips and handpiece can be sterilized. The handpiece attaches to the hoses on the dental unit with a swivel attachment coupling. Air and water pressure are controlled by using the air and water control valves on the dental unit. The three type tips and their uses are as follows:

- Universal tip—Used for all surfaces to remove medium and heavy calculus deposits



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**Figure 3-17.—Sonic scaler handpiece and tips. Left to right: Universal, Perio, and Sickle tip.**

- Perio tip—Breaks up heavy calculus and is recommended for supragingival scaling of the lingual mandibular incisors
- Sickle tip—Recommended for sensitive patients, and to remove light to medium deposits of calculus

### Technique

Lightly apply the vibrating tip to the tooth's surface using a back and forth brush stroke to dislodge the calculus deposits. The handpiece directs a continuous water spray to cool the tip and tooth to prevent overheating. Avoid placing the scaler tip directly on the enamel since this will cause pitting.

### Level I Maintenance

Follow the manufacturer's instructions for instrument sterilization and other maintenance requirements. As with other devices supplied with water from the dental unit, flush the sonic scaler waterline for 60 seconds at the beginning of the workday and for 30 seconds between patients.

## PERIODONTAL SCALING INSTRUMENTS

Periodontal hand scalers are important in removing calculus. These instruments are discussed in chapter 6, "Periodontal Assistance." In addition to hand scaling instruments, part of your preventive dentistry setup will include a mouth mirror and an explorer.

### MOUTH MIRROR

The mouth mirror permits examination of tooth surfaces in areas of the mouth that cannot be viewed directly. The mouth mirror is also useful as a retractor of the patient's tongue and cheeks.

Avoid causing discomfort to the patient when you are using the mouth mirror. Do not use excessive pressure on the handle or shank against the patient's lips or the corner of the mouth. Do not press the edge of the mirror into the gingiva. Since some teeth are sensitive to metal, do not touch the teeth with the mirror when you are inserting it into or removing it from the mouth.

You can prevent fogging of the mirror by:

- Requesting the patient breathe through the nose, rather than the mouth

- Using a special defogging solution
- Warming the mirror by holding it against the patient's buccal mucosa
- Heating the mirror under warm running water

Hold the mirror with a modified pen grasp and use a finger rest close to the area being viewed.

## EXPLORER

The explorer is used for tactile examination of the teeth. It is excellent for detection of calculus. Use it over the entire dentition to ensure all detectable calculus and stains have been removed following an oral prophylaxis. Otherwise, it is likely you will leave some calculus deposits or stains on the teeth.

## INSTRUMENT GRASP

A correct instrument grasp has a direct bearing upon your ability to manipulate instruments. There are three instrument grasps that you may use in combination with a finger rest during oral prophylaxis procedures. We will describe them in the following paragraphs.

### PEN GRASP

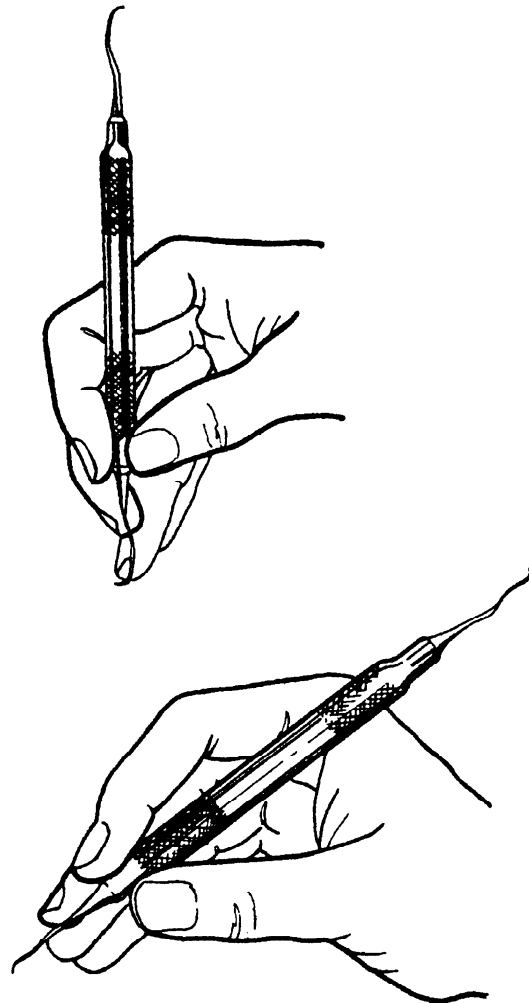
With the pen grasp, hold the instrument the way you would hold a pen when writing. Grasp the handle with your thumb and first finger while your middle finger supports the instrument from underneath. This is a favorite grasp when using the mouth mirror.

### MODIFIED PEN GRASP

With the modified pen grasp, hold the instrument in basically the same way as in the pen grasp, except that the fleshy part of your middle finger rests lightly on the shank of the instrument (fig. 3-18). This finger is used to feel the shank vibrate when the instrument's working end rubs over a rough surface. The middle finger also helps to guide the instrument. The ring finger is used to stabilize the hand in the patient's mouth. Balance your hand and the instrumentation with this finger.

### PALM GRASP

When using the palm grasp, the index, middle, ring, and little finger hold the instrument so that it rests in the palm of your hand. Your thumb remains free to stabilize your hand in the patient's mouth, or it may be



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Figure 3-18.—Modified pen grasp.

used to support an instrument when sharpening (fig. 3-19). This grasp is rarely used in the mouth and only when exceptional force is needed.

## FINGER REST

Use a finger rest or fulcrum to maintain control of the instrument. It is a stabilizing point for your hand while you are operating in the mouth. You should use a finger rest in the same arch and as close to the working area as possible. In the modified pen grasp, the third or ring finger is always used as a finger rest. This finger can rest on the teeth, the gingiva, another finger, or a combination of these. **Do not** use soft movable tissue for a finger rest. When you are holding the instrument in a pen grasp, use your third finger as the finger rest. When you are using the palm grasp, use your thumb for

## ORAL PROPHYLAXIS PROCEDURES

As you perform the prophylaxis procedure, remember that you are treating a living, breathing human being. You must accomplish your task in a manner that does not irritate the patient. Your job is not to chastise the patient for past dental neglect, but to **rehabilitate** and **educate** the patient toward improved oral health.

Before starting any scaling or prophylaxis procedure, ensure that your patient takes out of the mouth any removable partial or complete dentures that are present. This lets you inspect all the oral tissues and will avoid possible damage to the prosthetic teeth during the scaling or polishing procedures. Place the prosthetic appliance in a cup of water or in a moist towel.

Be as gentle as possible during the scaling procedure so that you do not injure the tooth or its surrounding tissues. Frequently irrigate and suction the scaling site to prevent particles of calculus from becoming implanted in the gingival tissues.

While scaling, you will occasionally need to remove calculus and debris from the working end of your instrument. You can do this in several ways. You can place a dampen dish containing hydrogen peroxide on the bracket table and simply dip the instrument tip into the solution, or you can wipe the instrument on a gauze sponge attached to the towel chain or held in your non-scaling hand. Avoid wiping the instrument directly on the patient's towel because blood and debris from your hands or the instrument can stain the patient's clothing.

### A SYSTEMATIC APPROACH TO PERIODONTAL SCALING

You should approach each patient with a specific plan of treatment. This will vary with individual patient needs. A routine oral prophylaxis for a patient who practices adequate oral hygiene can usually be completed in one appointment. Patients who have neglected their oral health, such as those with periodontitis and or have subgingival calculus, will be appointed with a dental hygienist or dentist.

Your examination and scaling procedure should be done with a definite routine. By using a routine, you will be able to treat as many teeth as possible from one position, and ensure you will not overlook any tooth or tooth surface. The recommended routine is as follows:

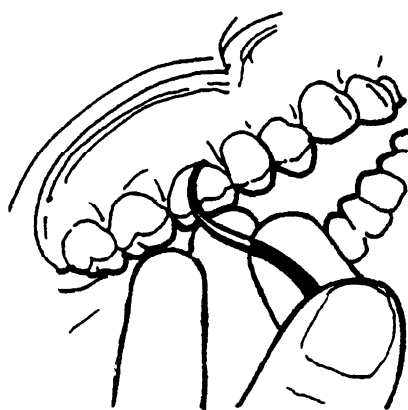
1. Mandibular anterior teeth



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Figure 3-19.—Palm grasp.

the finger rest. The same finger that is used as a finger rest also acts as a fulcrum, the pivot point around which the necessary force to remove the calculus can be exerted. Figure 3-20 illustrates the correct finger position for a finger rest.



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Figure 3-20.—Finger rest.

2. Right mandibular posterior teeth
3. Left mandibular posterior teeth
4. Maxillary anterior teeth
5. Right maxillary posterior teeth
6. Left maxillary posterior teeth

Starting with the mandibular anterior teeth, examine the facial and proximal surfaces. Then, scale those surfaces. Next, examine and scale the lingual and proximal surfaces. After you have completed the mandibular anterior teeth, follow the routine until the entire dentition (all teeth) has been examined and scaled.

## CALCULUS REMOVAL

Dental Technicians are only allowed to remove **supragingival calculus**. Supragingival calculus is defined as calculus **above the gumline**. Subgingival calculus removal and root planing are only to be performed by a dentist or dental hygienist. Figure 3-21 illustrates subgingival and supragingival calculus.

Scaling the teeth removes calculus by mechanically fracturing the deposits off each tooth. It is relatively simple to remove large deposits of supragingival calculus, but removing the smaller pieces that are left behind when the larger pieces fracture off takes practice to ensure the tooth surface is calculus-free.

Supragingival calculus may be detected visually. It will appear as a white, chalky, or yellow deposit on the tooth surface. Drying the tooth surface with air from the three-way syringe will make a deposit easier to see.

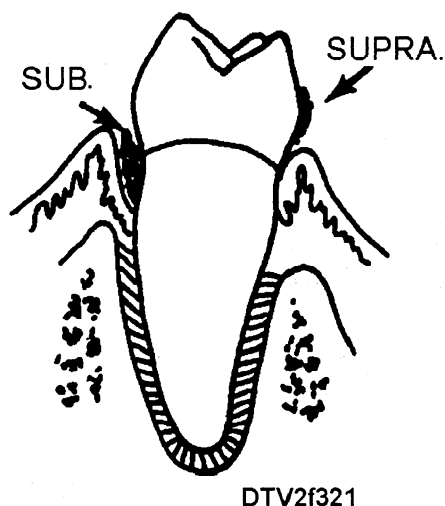


Figure 3-21.—Subgingival and supragingival calculus.

You can also detect supragingival calculus by passing the point of an explorer over the teeth. Enamel will feel hard and smooth as the explorer tip passes freely over it. Calculus feels rough and will interfere with the free movement of the explorer tip. The easiest way to detect supragingival calculus is by using a disclosing agent. This will enable you to visually identify stained areas of plaque and calculus.

## SCALING INSTRUMENTS

Your choice of an instrument is determined primarily by the amount of calculus present. If the patient has a large amount of supragingival calculus or heavy stain, you may want to start your scaling procedure with the ultrasonic or sonic instrument. After you have removed the calculus or heavy stain, you then can use the various hand instruments to remove the remaining deposits. If the patient has a light to moderate accumulation of supragingival calculus, you may choose to complete the entire procedure with hand instruments.

## INSTRUMENTATION

After you have located the calculus deposits, you are ready to perform the instrumentation necessary to remove them. There are four basic scaling strokes: exploratory, vertical, horizontal, and oblique.

### Exploratory Stroke

The exploratory stroke is used to determine the general outline of the deposits. To perform the exploratory stroke, hold the scaler or curette lightly in a modified pen grasp. Holding the instrument lightly will increase your sense of touch. Establish a finger rest, then move the cutting edge of the blade across the tooth surface toward the gingiva. When you feel the calculus, continue moving the blade until the cutting edge reaches the border of the deposit. **Do not** insert the blade below the gingiva. Position the cutting edge of the instrument next to the border of the calculus deposit (fig. 3-22). You are now ready to change to a vertical, horizontal, or oblique scaling or working stroke (fig. 3-23) depending on the location of the calculus.

### Vertical Stroke

The vertical stroke parallels the long axis of the tooth. Use this stroke to remove calculus from the proximal surfaces of the teeth. It is considered the

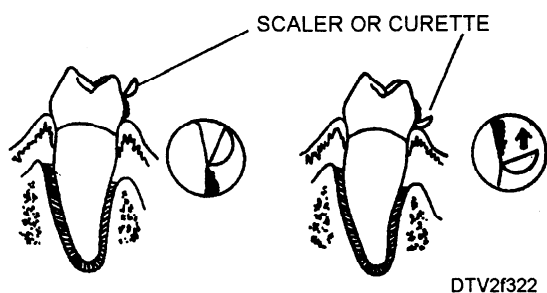


Figure 3-22.—Exploratory stroke.

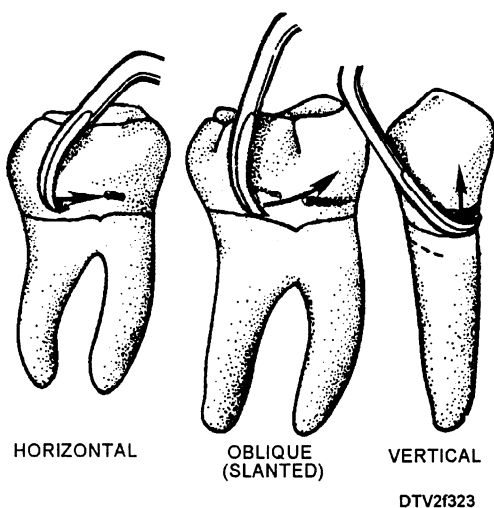


Figure 3-23.—Scaling strokes.

safest scaling stroke because the cutting edge of the instrument does not come in contact with the epithelial attachment.

### Horizontal Stroke

The horizontal stroke will parallel the gingival margin. Use this stroke cautiously to remove supragingival deposits from the facial and lingual surfaces of the teeth.

### Oblique Stroke

The oblique or slanted stroke is made at a 45° angle to the long axis of the tooth. Use this stroke to scale the majority of the tooth's surfaces. However, the direction of the stroke that you select will depend on the type of instrument, the area of the mouth, and the tooth surface involved.

### Activating the Stroke

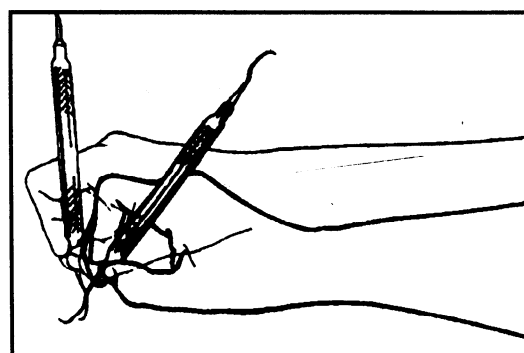
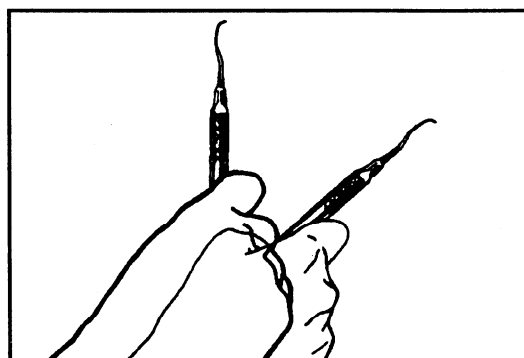
Before starting the working phase of the stroke, tighten your grip on the instrument. Use your hand,

wrist, and arm to activate the instrument (fig. 3-24). Avoid scaling with independent finger movements as this technique is extremely fatiguing. Your working stroke should be short, controlled, decisive, and directed in a manner to protect the tissues from trauma. With a short stroke, you can maintain control of the instrument and adapt the cutting edge to variations in the tooth surface. Always keep as much of the working blade (not just the point) on the tooth as possible. The exact length of the stroke depends on the height of the deposits. During the working stroke, you should slightly increase the pressure on the fulcrum to balance the pressure of the instrument on the tooth.

**Never** remove calculus by shaving it in layers. Shaving often leaves a thin layer of calculus, which is difficult to distinguish from the tooth surface. This thin layer can serve as a nucleus for new plaque and calculus formation. After you have completed the scaling procedure, you are ready to polish the teeth.

### POLISHING TEETH

The current treatment plan in the patient dental record will indicate whether or not a tooth polishing should be done. However, if the gingiva has been irritated during scaling, you may have to schedule the Polishing Procedure for a later date. Have a dental



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Figure 3-24.—Instrument activation.

officer evaluate the tissue condition if any questions exist.

Tooth polishing removes plaque or stains remaining on the teeth after thorough scaling. Improper use of a prophy cup and abrasive paste can have harmful effects on the teeth including: loss of tooth structure, removal of fluoride-rich surface enamel, thermal injury to the pulp, and trauma to soft tissues.

## Materials and Equipment

A typical tooth polishing setup (fig. 3-25) includes a mouth mirror, slow-speed handpiece with a prophylaxis angle attachment, rubber polishing cup, tapered bristle brush, dental floss, and prophylaxis paste.

Many different types of prophylaxis (sometimes abbreviated as "prophy") angle attachments are available. Disposable or single-use prophy angles are recommended; however, sterilizable prophy angles are equally effective, can be more economical, and are widely used in the Navy. There are latch and screw-type rubber polishing cups. Ensure that the prophy angle and the type of rubber cup you select are compatible. Follow the manufacturer's instructions for use and maintenance of handpiece and prophy attachments.

The use of single-unit prophylaxis paste prevents waste and cross contamination. Commercially prepared pastes containing fluoride are commonly used in the Navy and are available in popular flavors. Pastes are also available in fine, medium, coarse, and coarse grits. Select the abrasiveness appropriate for removal of the stains present. A fine paste will not efficiently remove heavy stain. A coarse paste will

needlessly remove enamel when treating fine stains. A tapered bristle brush may be used to polish the occlusal surfaces of the teeth.

## Precautions

You must be careful when you use the handpiece and prophylaxis attachment. Neither a polishing cup nor bristle brush should contact soft tissue. Such contact could injure the tissue. Only use the bristle brush on occlusal surfaces of teeth, well away from the soft tissue.

You must also be careful to avoid friction between the cup or brush and the tooth. Friction causes heat, and heat can harm the tooth pulp and cause pain to the patient. For this reason, always run the handpiece at the **slowest** of the slow speeds. The speed of the handpiece is controlled by a foot-operated rheostat. Use firm pressure when applying the rubber cup to the surface that needs polishing. You will know that you have applied sufficient pressure when you see the cup's edge flare slightly. Don't bounce the cup on and off the tooth. Keep the cup in **constant** motion while in contact with the tooth. To avoid splattering paste, bring the cup almost in contact with the tooth before the cup starts turning. Follow all safety precautions. You should always wear protective gloves, glasses, and mask. Drape the patient to protect his or her clothing.

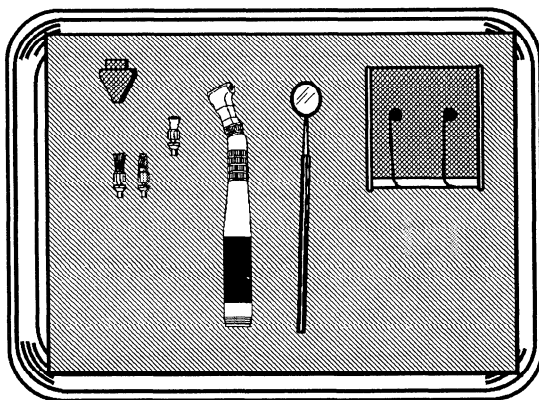
## Polishing Routine

You should polish the patient's teeth according to a definite sequence. A typical sequence would start with the maxillary arch and polish the teeth as follows:

- All facial surfaces—from the right quadrant to the left quadrant.
- All lingual surfaces—from the left quadrant to the right quadrant.
- All occlusal surfaces—from the right quadrant to the left quadrant.

As you polish, begin at the gingival margin of the tooth and work toward the occlusal or incisal edge, using vertical or oblique pulling strokes. Rinse the working area with water from the three-way syringe as needed and have the patient use the saliva ejector to remove the debris from the mouth.

You may not be able to reach all of the interproximal areas with the polishing cup. To polish these areas, place the polishing paste in the facial and



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Figure 3-25.—Tooth polishing setup.

lingual embrasures and carry it into the interproximal space with dental floss or dental tape.

At the end of the polishing, carefully floss the patient's teeth. This is an excellent opportunity to begin your oral hygiene instruction. Have the patient watch you with a hand-held mirror. When flossing is complete, rinse and remove any debris remaining in the mouth. Once the teeth have been cleaned of plaque and calculus, topical fluoride can be applied professionally if the procedure is indicated in the current treatment plan.

### **Fluoride Application**

Topical fluoride can be administered by three different methods. The first method involves the application of fluoride solution. This type of fluoride must be painted on the teeth with a cotton tip applicator. The second method of fluoride application is the use of a concentrated fluoride rinse. The third method is the tray technique, which is used to apply fluoride gels. Gel application is generally regarded as the most effective means of topical fluoride treatment. We will focus our attention on fluoride gel application.

A variety of trays are available for fluoride gel application. The use of disposable trays reduces the chance of cross contamination and eliminates the need to clean and sterilize reusable ones. Trays come in several arch sizes to ensure optimal fit for each patient. The tray should provide complete coverage of all erupted teeth without going beyond the most distal tooth surface in the arch. Custom-fitted trays can be made that require less gel and promote contact of the gel with the teeth. The extra time and expense of custom fluoride tray fabrication will limit the use to specific patients who require daily application of fluoride gel.

Reexamine the mouth to estimate the size of the dental arches and identify any features such as malposed teeth or bony tori that will influence tray selection. Select a maxillary tray and try it into the patient's mouth. Make sure all teeth will be contacted by the gel. Remove it and do the same for the mandibular arch. Refer to the manufacturer's instructions for the amount of gel required for each tray. A narrow strip of material along the bottom of the tray is normally adequate. This technique will minimize the amount of gel required and will reduce the chance that excess gel will be swallowed by the patient. The patient's teeth must be dried and kept as dry as possible until trays are inserted. Dry each arch

separately before placing the tray into the patient's mouth.

First place the mandibular tray. Retract a corner of the mouth with your finger. Insert one end of the tray in the mouth at an angle and then rotate the other end of the tray into the mouth. Insert the saliva ejector before placing the maxillary tray. Place the maxillary tray in a similar fashion and ask your patient to close his or her teeth together gently. Refer to the manufacturer's instructions for the amount of time the gel remains in the mouth. Generally, application is no longer than 4 minutes. After the trays have been removed, allow your patient to expectorate (spit) any remaining fluoride from the mouth. Instruct the patient not to rinse, drink, eat, or smoke for at least 30 minutes.

## **ORAL HYGIENE INSTRUCTIONS**

A vital part of any preventive dentistry program is the education and motivation of patients in proper oral hygiene. During the appointment you must take the time to explain the harmful effects of bacterial plaque and demonstrate proper tooth brushing and flossing techniques. It is recommended that you review *Dental Technician*, Volume 1, chapter 5, "Oral Pathology," and chapter 8, "Nutrition and Diet," as this information also plays an important role in oral hygiene.

### **INSTRUCTION ATMOSPHERE**

The atmosphere you create for your oral hygiene instruction will influence your ability to communicate with the patient. Position yourself in front of the patient so that you can look directly into the eyes and observe the patient's responses to your instructions. You may want to repeat or clarify points that the patient's response suggests he or she does not understand or if the patient questions what you have said. In most cases, sitting on the dental stool and facing the patient from the front is a good instructional position. This position allows you to view the patient's facial expression. Being at the same eye level as the patient also helps you establish rapport, since you are not talking "down" to them.

Talk directly to your patient and smile occasionally. If you stare at the wall or some other inanimate object during your presentation, the patient will get the impression that you are not sincere or interested. Use simple words, and explain any scientific or technical terms with which the patient may not be familiar. Your patient may not know that

"gingiva" is the technical term for "gums," and they might think "calculus" is a form of mathematics. Use simple layman terms.

The use of visual aids, such as charts and patient literature, can help illustrate the progression of dental disease or effective hygiene techniques and reinforce your discussion with the patient. The use of a disclosing agent can increase the impact of your instruction on the patient. By using this agent before the appointment, you can actually show the patient the areas that he or she missed during the cleansing technique. Remember your job is not to chastise the patient for past neglect, but to educate and encourage improvement in oral hygiene.

## HOME CARE

Home care is NOT limited to the home. Let your patients know that they can keep extra toothbrushes and dental floss at work. The difference between oral hygiene and dental disease is not toothbrushing, but mouth cleansing. Everybody brushes their teeth, but the goal is to thoroughly clean the mouth.

One of the major causes of tooth decay and periodontal disease is bacterial plaque. Bacterial plaque is an almost invisible film of water, containing cells and millions of living bacteria. To prevent dental diseases, you must effectively remove this destructive film **at least once** during a 24-hour period. By keeping your teeth and gums clean, you will have better health, retain your natural appearance, enjoy chewing and talking, and prevent bad breath.

## EFFECTIVE TOOTHBRUSHING

The toothbrush can remove the bacterial film from the facial, lingual, and occlusal surfaces of the teeth. Brush gently but with enough pressure to feel the bristles on the gum. Do not use so much pressure that you feel discomfort. The method we will describe here, the "**Modified Bass**" technique, is effective and relatively easy for most patients to perform. Sometimes other methods are recommended in special situations, such as malocclusion.

Toothpaste foams and prevents you from seeing if you are placing the brush properly. While a person is learning to brush properly, it is best to omit toothpaste or use it in a second brushing.

Your toothbrush should have soft, multitufted nylon bristles. It should have a rigid plastic handle and a small and flat head.

- For all facial surfaces and the posterior lingual surfaces, point the bristles at the teeth at a 45° angle. Lay the bristles in the sulcus area and use a gentle vibrating motion (fig. 3-26).

- For the lingual surfaces of the anterior teeth, place the brush as shown in figure 3-27 and use small circular scrubbing strokes.

- When brushing the occlusal surfaces, place the bristles flat on the surface and use the same scrubbing strokes as for the other surfaces (fig. 3-28). Move the bristles around the mouth in a regular pattern so as not to skip any areas.

## ELECTRIC TOOTHBRUSHES

Many electric toothbrushes are accepted by the American Dental Association (ADA) and have earned its seal of approval. Always follow the manufacturer's instructions on the use and maintenance of these products.

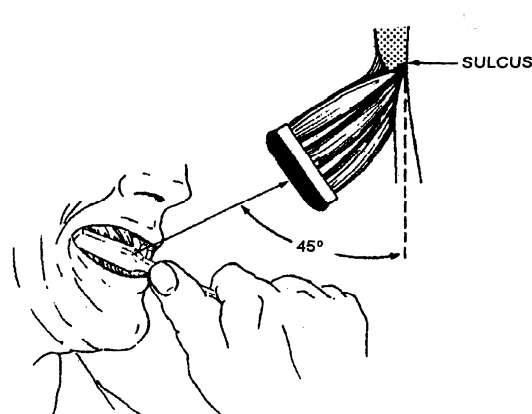


Figure 3-26.—Brushing the sulcus area.

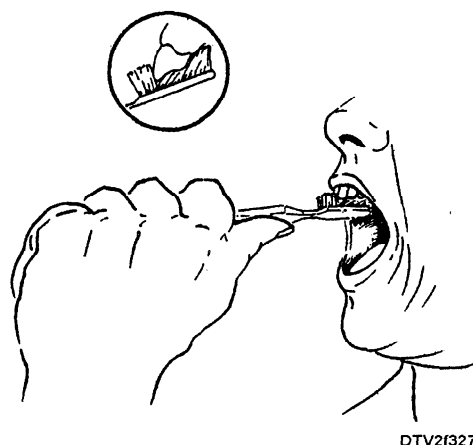
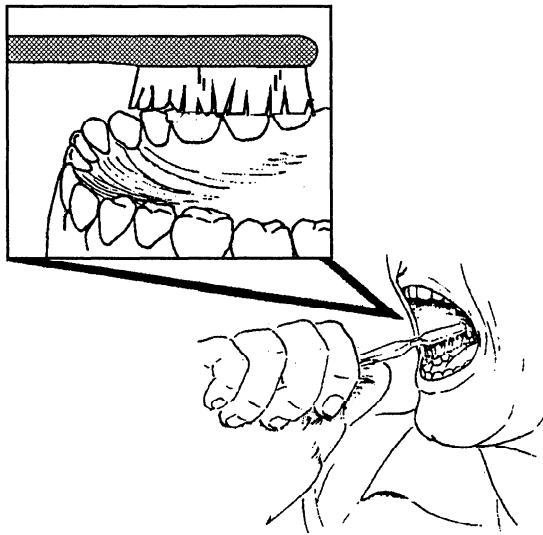


Figure 3-27.—Brushing the lingual surfaces of anterior teeth.





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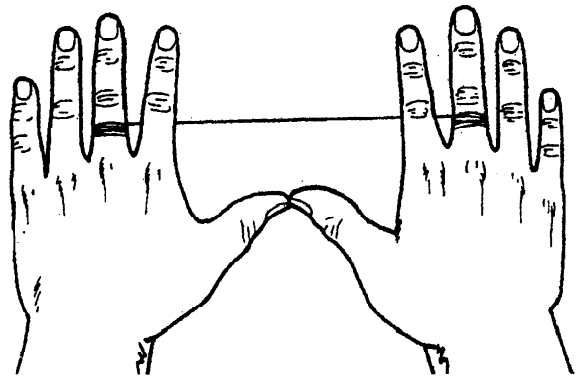
Figure 3-28.—Brushing the occlusal surfaces.

## USE OF DENTAL FLOSS

For most people, dental decay and periodontal disease most often occur between or on the proximal surfaces of teeth. The toothbrush cannot clean these areas effectively or clean behind the last tooth in each arch. Dental floss is best for cleaning these areas. Both waxed and unwaxed floss clean equally effectively. However, a patient with very tight interproximal contact areas may find waxed floss is easier to use. Patients who have suffered a loss of interproximal tissues may use dental tape.

When patients are first learning to floss, they may find it difficult to accomplish. You should assure them that with practice, flossing will become easier. In addition, some patients may feel discomfort and have bleeding around the gingiva the first few times they floss. Assure them that the discomfort and bleeding will go away in a day or two. To ease the discomfort, you may recommend that such patients should use a warm salt water rinse after flossing.

To properly floss, cut off a piece of floss about 18 inches long and lightly wrap the ends of the floss around your middle finger, as shown in figure 3-29. The fingers controlling the floss should not be more than one-half inch apart. Do not force the floss between the teeth. Insert it gently by sawing it back and forth at the point where the teeth touch each other. Let it slide gently into place. With both fingers, move the floss up and down on the side of one tooth, and then repeat on the side of the other tooth until the surfaces



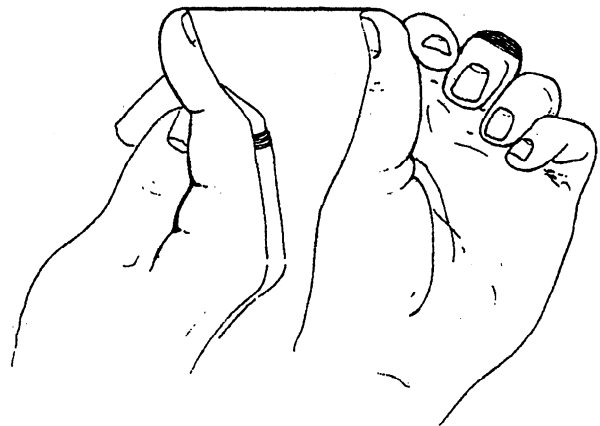
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Figure 3-29.—Floss wrapped around middle fingers.

are "squeaky" clean. Use your fingers to curve or bend the floss around the tooth. Go carefully under the gum line with the floss since this is a sulcus where plaque collects. Slide the floss down until you feel resistance, but do not go far enough into the gum to cause discomfort, soreness, or cut the gum tissue that will cause bleeding. When the floss becomes frayed or soiled, a turn from one middle finger to the other brings up a fresh section.

- To clean between the upper **left** back teeth, pass the floss over your thumb and forefinger of your right hand (fig. 3-30). To see the proper position of the hands, look at figure 3-31. The thumb is placed on the outside of the teeth and helps hold the cheek back.

- To clean between the upper **right** teeth, pass the floss over your right thumb and forefinger on your left hand. Now the right thumb is outside the teeth and the left forefinger is on the inside.



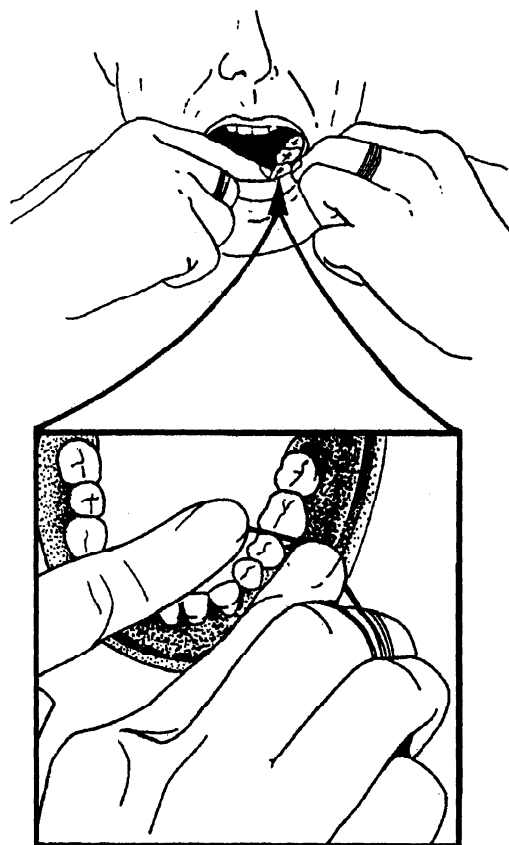
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Figure 3-30.—Floss position for the maxillary posterior teeth.



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Figure 3-31.—Hand position for flossing maxillary posterior teeth.



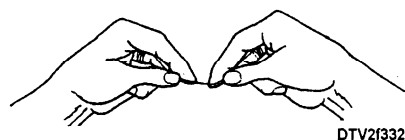
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Figure 3-33.—Hand position for flossing mandibular posterior teeth.

- To clean between all lower teeth, hold the floss with the forefingers of both hands (fig. 3-32). You can insert the floss gently between all lower teeth with the floss over your forefingers in this position. Figure 3-33 illustrates the correct method for flossing between the lower back teeth, using the two forefingers to guide the floss.

## EVALUATION

Are your patient's teeth clean? When flossing has been completed, rinse vigorously with water to remove food particles and plaque. Also advise the patient to rinse with water after eating if unable to floss or brush. Neither rinsing alone nor water-spraying devices remove the bacterial plaque because of the glue-like



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Figure 3-32.—Floss position for the mandibular teeth.

material in the plaque. To ensure all areas of the teeth are clean, a disclosing agent can be used to determine if any surfaces on the teeth were missed during flossing.

## SENSITIVITY

After treatment of the teeth or gums, the exposed root surfaces may be sensitive to cold and heat. This condition is usually temporary if the teeth are kept clean. If the teeth are not kept clean, the sensitivity may remain and become more severe. For the few patients who have severe sensitivity, the use of specially medicated toothpastes and mouthwashes may be recommended.

## DENTIFRICE

Although dentifrices (toothpaste) are **not** necessary for effective cleaning of the teeth, they may be refreshing for the patient and have a psychological benefit. Instruct your patients that if they wish to use a dentifrice, they should select a fluoridated toothpaste displaying the ADA seal of approval.

## MAINTENANCE OF PROSTHETIC APPLIANCES

If your patient has a prosthetic appliance, tell him or her to take the removable appliance out of the mouth after meals and thoroughly brush it. Patients should use a good prosthetic appliance brush and their preferred dentifrice or soap and water. Have the patient follow the dentist's instructions regarding how long to leave the appliance out of the mouth while sleeping to give the tissues proper rest and how to take care of the appliance when it is not worn.

Plaque accumulates on the surfaces of abutments and beneath the pontics of fixed partial dentures (bridges). **Floss threaders** are thin plastic devices that help the patient direct the floss into these areas. Fixed partial dentures should also be cleaned at least once daily.

## ORAL HYGIENE AIDS

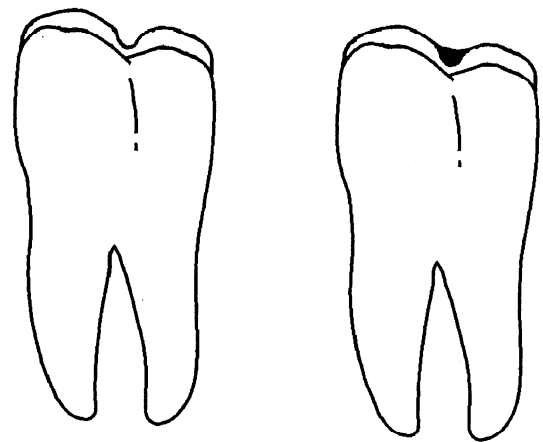
Toothpicks, interdental proximal brushes, oral irrigators, and mouthwashes are aids to oral hygiene. They may be used in addition to, but not in place of, tooth brushing and flossing. These products will be recommended by a dentist or dental hygienist and should bear the ADA seal of approval.

### APPLICATION OF PIT AND FISSURE SEALANTS

A pit and fissure sealant is a plastic resin-like material that is applied to the tooth surface and hardened. The plastic resin bonds into the depressions and grooves (pits and fissures) of the chewing surfaces of back teeth. Sealants are highly effective in preventing pit and fissure caries in premolars and molars. The sealant acts as a barrier protecting enamel from plaque and acids. Figure 3-34 illustrates a before and after drawing of a sealant on a tooth. Acid-etch resin sealants are classified into three types, based on the method by which they are cured (hardened):

- Ultraviolet light-cured
- Chemically or self-cured
- Visible light-cured

As a basic dental assistant, you may receive training in expanded functions to place pit and fissure sealants as described in BUMEDINST 6600.13. Check with your command on certification requirements. Pit and fissure sealants may only be placed by certified personnel. Only a dental officer can



BEFORE SEALANT

AFTER SEALANT

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Figure 3-34.—Before and after applying a sealant on a tooth.

authorize and recommend what teeth require sealants. This will be noted on the patient's treatment plan.

The following clinical guidelines should be followed for successful sealant application:

- Ensure the patient's treatment plan indicates what teeth require sealants.
- Ensure the proper eye and clothing protection are in place for you and the patient.
- The teeth must be isolated to prevent saliva contamination of the surfaces to be sealed. The isolation must provide adequate access to observe the field and to reach the tooth surfaces with the appropriate instruments. A rubber dam is the preferred method of isolation, but if a rubber dam cannot be used, cotton roll isolation can be effective.
- The tooth surfaces should be cleaned with a prophylaxis brush or rubber cup and a cleansing agent containing no oil or other substance that cannot be completely and quickly washed away using an air/water syringe with high-speed evacuation.
- When the teeth are effectively isolated from saliva contamination, the tooth surfaces are dried and then etched by an application of a 30 to 50 percent phosphoric acid solution for 15 to 20 seconds. Etching should cover all the areas to be sealed.
- The acid should be washed away with water. The surfaces are then carefully re-dried and inspected to ensure that the area intended for sealant has a "frosted" appearance. The **absolute** avoidance of contamination with saliva or air-line moisture or oil is critical from the time of acid removal and drying, until the sealant is

cured. If contamination is suspected, re-etching of the surface for 20 seconds is indicated.

- The sealant should be applied according to the manufacturer's instructions. Care should be taken to avoid entrapment of air bubbles, to extend the sealant into all the grooves and pits, and to avoid extension of the sealant onto unetched smooth surfaces or soft tissues. The sealant must remain uncontaminated and undisturbed until it is cured to hardness.

- The sealant should be examined by yourself first, and then checked by a dentist to ensure that

underextension, overextension, undercuring, voids, and high spots have not occurred. A reasonable attempt should be made to remove the sealant to determine if adequate bond strength has been established.

Fluoride should not be applied to the enamel surface immediately before a sealant procedure is initiated. Fluoride may be applied immediately after sealant application.

The most common reason for sealant failure is contamination of the etched surface with saliva or air-line moisture (from the air syringe) or oil.